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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,453	01/28/2005	Samuel Leroux	026032-4867	7958

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FOLEY & LARDNER LLP  
777 EAST WISCONSIN AVENUE  
SUITE 3800  
MILWAUKEE, WI 53202-5308

EXAMINER
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BARNEY, SETH E

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/523,453

Applicant(s)

LEROUX, SAMUEL

Examiner

Seth Barney

Art Unit

3752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/2/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because the angle of the apex of the frustoconical segment has not been clearly shown. Furthermore, the angle does not appear to be substantially 40 degrees. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 3752

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3,13, 7,16, and 19-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Regarding claims 3 and 13, the term "less than about" is indefinite because the term "about" includes values both above and below the claimed value, while "less than" require the values to be below.
5. Regarding claims 7 and 16, a single part cannot comprise two separate parts.
6. Regarding claims 19-21, the term "unexpected" does not have definite meaning in the art and therefore renders the claim indefinite.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5,8-14,17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Merminod et al (WO 99/57465).

Regarding claims 1,10, and 18 Merminod discloses a gaseous fuel injector comprising:

-a body (10).

-a chamber of the body in which there is mounted a valve member (17) and an actuator means (13) for actuating the valve member between a closed position and an open position in which the valve member defines a fuel flow section. See Figure 1.

-a fuel feed duct (26).

-a fuel delivery duct (36).

-wherein the fuel feed duct and the fuel delivery duct open out into a chamber of the body. See Figure 1.

-wherein the fuel delivery duct comprises a calibrate segment (23) of a section smaller than the fuel flow section defined by the valve member when the valve member is in an open position. See Figure 1.

Regarding claims 2 and 12, the fuel delivery duct comprises a frustoconical segment (around 24) extending form the camber to the calibrated section, tapering towards the calibrated section. See Figure 1.

Regarding claims 3 and 13, the frustoconical segment is about 55 degrees. See Figure 1.

Regarding claims 4 and 11, the fuel delivery duct is arranged to obtain a flow speed of fuel in the calibrated segment that is substantially sonic. See page 8 lines 2 to 6 of the specification.

Regarding claims 5 and 14, the angle at the apex is substantially 40 degrees. See Figure 1.

Regarding claim 8, the actuator means comprises a mechanical means (15). See Figure 1.

Regarding claims 9 and 17, the mechanical means comprises a spring (15). See Figure 1.

Regarding claim 19, as best understood, Merminod discloses a fuel injector having a body and means for delivering fuel (23) without unexpected variations in the flow rate.

Regarding claim 20, as best understood, the fuel injector further comprises a chamber, means for defining a fuel flow section (26 to 36), and the means for delivery fuel without unexpected variations in flow rate comprises means for delivering fuel to the chamber, the means for delivering fuel to the chamber being associated with the means for delivering a fuel flow section. See Figure 1.

Regarding claim 21, as best understood, the means for delivery the fuel to the chamber comprises a frustoconical segment. See Figure 1.

9. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,080,288 to Shen.

Regarding claims 1, 10, and 18 Shen discloses a gaseous fuel injector comprising:

- a body.
- a chamber of the body in which there is mounted a valve member (17) and an actuator means (21) for actuating the valve member between a closed position and an open position in which the valve member defines a fuel flow section. See Figure 1.
- a fuel feed duct (19).
- a fuel delivery duct (duct in part 12).

-wherein the fuel feed duct and the fuel delivery duct open out into a chamber of the body. See Figure 1.

-wherein the fuel delivery duct comprises a calibrate segment (14) of a section smaller than the fuel flow section defined by the valve member when the valve member is in an open position. See Figure 1.

Regarding claims 2 and 12, the fuel delivery duct comprises a frustoconical segment (before 14) extending form the camber to the calibrated section, tapering towards the calibrated section. See Figure 1.

Regarding claims 3 and 13, the frustoconical segment is about 55 degrees. See Figure 1.

Regarding claims 4 and 11, the fuel delivery duct has the same structure as the instant application (a frustoconical segment leading to a smaller cross section outlet orifice and finally to a larger cross section delivery duct) and therefore is arranged to obtain a flow speed of fuel in the calibrated segment that is substantially sonic. See Figure 1.

Regarding claims 5 and 14, the angle at the apex is substantially 40 degrees. See Figure 1.

Regarding claims 6,7,15, and 16, the injector of Shen has a bottom half body (10) and an end piece (12 or 13) mounted on the bottom half body.

Regarding claim 8, the actuator means comprises a mechanical means (18). See Figure 1.

Regarding claims 9 and 17, the mechanical means comprises a spring (18). See Figure 1.

Regarding claims 19-21, as best understood, Shen discloses a fuel injector having a body with the same structural elements of the instant application (a frustoconical segment leading to a smaller cross section outlet orifice and finally to a larger cross section delivery duct) and would therefore deliver fuel (23) without unexpected variations in the flow rate.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to show the art with respect to fuel injectors: Matsuda et al, Reinicke, Schulte, Beck et al., Trott, Knapp et al., Shimizu et al., Knapp et al. ('902).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seth Barney whose telephone number is (571)272-4896. The examiner can normally be reached on 7:30am-5:00pm (Mon-Fri), first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on (571)272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seth Barney  
Examiner  
Art Unit 3752

sb



ERIC KEASEL  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700